

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)



REC'D 29 DEC 2004

WIPO

PCT

Reg'd PCT/PTO 30 JUN 2005

10/541165

Applicant's or agent's file reference P1834PC00		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/FI 03/00961		International filing date (day/month/year) 16.12.2003	Priority date (day/month/year) 02.01.2003
International Patent Classification (IPC) or both national classification and IPC D21G1/00			
Applicant METSO PAPER, INC. et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 3 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 27.07.2004		Date of completion of this report 28.12.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Auer, H Telephone No. +49 89 2399-2054 	

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/FI 03/00961

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-13 as originally filed

Claims, Numbers

1-9 received on 29.11.2004 with letter of 29.11.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/FI 03/00961**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
- (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-9
	No: Claims	
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

2. Citations and explanations

see separate sheet

ad V:

1. Most relevant prior art document is WO-A-0163047, which is cited in the description and which discloses a method for calendering a fibrous web in a calender.

The problem of the invention is to produce a fibrous web within a broader range of gloss and smoothness without a need for threading of the fibrous web and for shutdown of the fibrous web machine, i.e., to change the grade of the fibrous web produced in on-line operation.

The solution is given by the combination of features of claims 1 and 3, i.e. in particular by increasing the number of calendering nips and by the selection of roll combinations in successive roll stacks.

There is no hint in WO-A-0163047 for this solution nor in the other documents cited in the search report which disclose only technological background.

Claims 1 and 3 are, therefore, in line with Articles 33(2) and (3) PCT.

2. The subject-matter of the dependent claims contain further embodiments of the invention and is also in combination with the independent claims novel and inventive (Articles 33(2) and (3) PCT).

Amended Claims

1. A method for calendering a fibrous web (W) in a calender (10) which includes at least two roll stacks (11L, 11R) which each have at least three rolls (1-5), and in which calender the fibrous web is passed to run between each roll pair (1, 2; 2, 3; 3, 4; 4, 5) of each roll stack, characterized in that in order to produce a selectable fibrous web grade, at least one roll pair (1, 2; 2, 3; 3, 4; 4, 5) in at least one roll stack (11L, 11R) is arranged to be in nip contact to form a nip (NC) that calenders the fibrous web (W), and
- in that by increasing the number of calendering nips (NC) in the calender (10), higher-quality paper grades, such as SC-A, SC-B, LWC and WFC grades, are produced and that by decreasing the number of calendering nips (NC) in the calender (10), lower-quality paper grades, such as NP, SC-C and/or MFC grades, are produced, and
- in that the roll combination in successive roll stacks (11L, 11R) of the calender (10) is selected from the group comprising 3+5, 5+5, 5+7 rolls.
2. A method as claimed in claim 1, characterized in that at least one roll pair (1, 2; 2, 3; 3, 4; 4, 5) in each roll stack (11L, 11R) is arranged to be in nip contact to form in each roll stack at least one nip (NC) that calenders the fibrous web.
3. A calender which includes at least two roll stacks (11L, 11R) which each have at least three rolls (1-5) and in which calender (10) a fibrous web (W) has been passed to run between each roll pair (1, 2; 2, 3; 3, 4; 4, 5) of each roll stack, characterized in that in order to produce a selectable fibrous web grade, at least one roll pair (1, 2; 2, 3; 3, 4; 4, 5) in at least one roll stack (11L, 11R) is in nip contact, whereby at least one nip (NC) is formed that calenders the fibrous web, and
- in that the roll combination in successive roll stacks (11L, 11R) of the calender (10) is selected from the group comprising 3+5, 5+5, 5+7 rolls, and

in that different paper grades, including NP, SC, MFC, LWC and WFC grades, can be produced by regulating the number and/or nip load of the closed i.e. calendering nips (NC).

- 5 4. A calender as claimed in claim 3, characterized in that at least one roll pair (1, 2; 2, 3; 3, 4; 4, 5) is in nip contact in each roll stack (11L, 11R) of the calender (10) to form in each roll stack (11L, 11R) at least one nip (NC) that calenders the fibrous web (W).
- 10 5. A calender as claimed in claim 3 and/or 4, characterized in that the calender (10) is selected from the group comprising OptiLoad, Janus and Prosoft calenders.
- 15 6. A calender as claimed in any one of claims 3 to 5, characterized in that the fibrous web (W) can be calendered on the calender (10) while all nips are operating, so that all roll gaps in each roll stack (11L, 11R) of the calender (10) are closed and form closed nips (NC), or while one/some of the nips is/are operating, so that at least one roll gap in at least one roll stack is an open roll gap (NO).
- 20 7. A calender as claimed in any one of claims 3 to 6, characterized in that operation with one/some of the nips is favourably suitable for the production of lower-quality paper grades, such as NP, SC-C and MFC grades, and operation with all nips is favourably suitable for the production of high-quality paper grades, such as SC-A, SC-B, LWC and WFC grades.
- 25 8. A calender as claimed in any one of claims 3 to 7, characterized in that at least one roll stack (11L, 11R) of the calender (10) includes power means (81, 82, 83) arranged between carrier arms (6), support arms or bearing housings of roll pairs (1, 2; 2, 3; 3, 4; 4, 5) formed by rolls placed one upon the other in order to adjust
- 30 the nip load and/or to form an open nip (NO) and/or to form a closed nip (NC)



between a roll pair by moving the rolls of the roll pair in a direction substantially towards each other or away from each other.

9. A calender as claimed in claim 8, characterized by carrier arms (6) of rolls (1-5) of a roll stack (11L, 11R), which carrier arms are divided into two parts by means of an articulated joint (9).

AMENDED SHEET